DRAFT FINAL
EXPANDED ENGINEERING EVALUATION/COST ANALYSIS (EEE/CA)
FOR THE
McLAREN TAILINGS SITE
COOKE CITY, MONTANA

Engineering Services Agreement DEQ/MWCB 401027
Task Order Number 05

Prepared for:

Mr. John Koerth
Montana Department of Environmental Quality
Mine Waste Cleanup Bureau
P. O. Box 200901
Helena, Montana 59620

Prepared by:

Pioneer Technical Services, Inc.
P.O. Box 3445
Butte, Montana 59702

May 2002

APPENDIX H

HEC-RAS MODELING RESULTS

PRELIMINARY
SODA BUTTE CREEK / MCLAREN TAILINGS SITE
HEC-RAS FLOOD ANALYSIS

Soda Butte Creek, in the vicinity of the McLaren Tailings Site, was analyzed for the 10-, 50-, and 100-year flood events (WS 10yr, 50yr, and 100yr, respectively) using the U.S. Army Corps of Engineers flood simulation program HEC-RAS (Hydrologic Engineering Center-River Analysis System). The objective of this analysis was to determine if published and computed flood volumes in Soda Butte Creek would encroach on the proposed repository site.

Table 1 lists published (USGS) and computed (Omang and Parrot, Upper Yellowstone, Montana) values for Soda Butte and Miller Creeks. Note that Miller Creek estimates for the two methods compare well, but USGS flow estimates for Soda Butte Creek are significantly higher than Omang and Parrot estimates. The USGS flood volumes are considered conservative and were therefore used in the flooding analyses.

Approximately 2,600 lineal feet of Soda Butte Creek and 300 lineal feet of Miller Creek were used to create stream profiles and regularly spaced cross-sections (see Figure 7-8 in the main text of the EEE/CA document for alignments). Spacing between cross-sections was 100-feet for Soda Butte Creek and 50-feet for Miller Creek. Detailed topographic data between Cooke City and Soda Butte Creek were not adequate for containing the entire flood volume; therefore, the topographic data were supplemented using the USGS 7.5 minute Cooke City quadrangle map (average ground slopes indicated on the quad. map were incorporated into the detailed topographic map in this area).

Figure 1 shows the cross-section at Station 7+00 on Soda Butte Creek (adjacent to the existing tailings impoundment, approximately 100-feet upstream from the McLaren tailings access road). This figure illustrates the 100-year flood elevation (WS 100yr-24hr) above the elevation of the existing tailings impoundment. According to this analysis, the surface of the current tailings impoundment would be flooded with water, if subjected to the WS 100yr-24hr event.

Figure 2 shows the cross-section at Station 14+00 on Soda Butte Creek (adjacent to the existing tailings impoundment, approximately 200-feet downstream from the Miller Creek confluence). The figure illustrates the 50- and 100-year flood elevation (WS 50yr-24hr and WS 100yr-24hr) above the surface of the existing tailings impoundment.

Figure 3 shows Station 24+00 on Soda Butte Creek (adjacent to the proposed repository). Note the 100-year flood crest elevation (WS 100yr-24hr) is approximately 7,590 feet (amsl). The approximate elevation of the proposed repository base at this location is estimated to be 7,620 feet amsl, 30 feet higher than the 100-year flood elevation.

The preliminary HEC-RAS simulation determined that the 100-year flood would not encroach on the proposed repository site.

Table 1: McLaren Tailings Computed Runoff Volumes (USGS and Omang & Parrot)				
	Soda Butte Creek (Omang & Parrot)	**Soda Butte Creek (USGS)**	**Miller Creek (Omang & Parrot)**	**Miller Creek (USGS)**
Area (sq miles)	5.5	5.5	2.6	2.6
E, Mean Basin Elevation (ft)	9000	9000	9000	9000
HE (% above 6000')	100	100	100	100
Reccurance Interval	Basin 1		Basin 2	
Years	cfs		cfs	
2	87.21		46.13	
5	149.90		82.94	
10	195.16	670.00	109.61	
25	246.66	835.00	141.68	
50	304.35		177.45	160
100	353.67	1665.00	209.33	190
500	477.98		293.70	

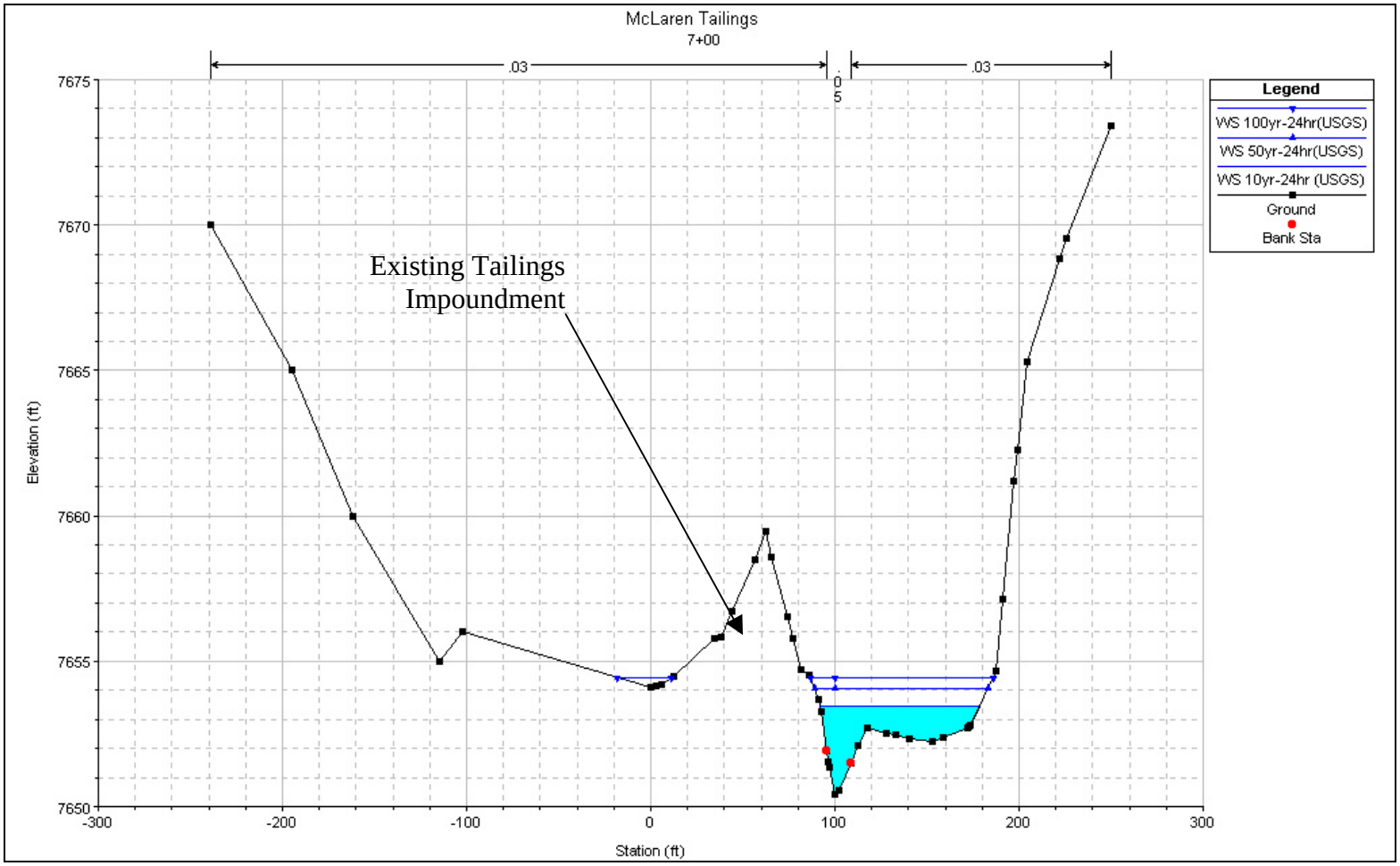

Figure 1: Cresting of the 50- and 100-year Flood Events onto the Existing McLaren Tailings Impoundment at Cross-Section 20 (Station 7+00 on Figure 7-8).

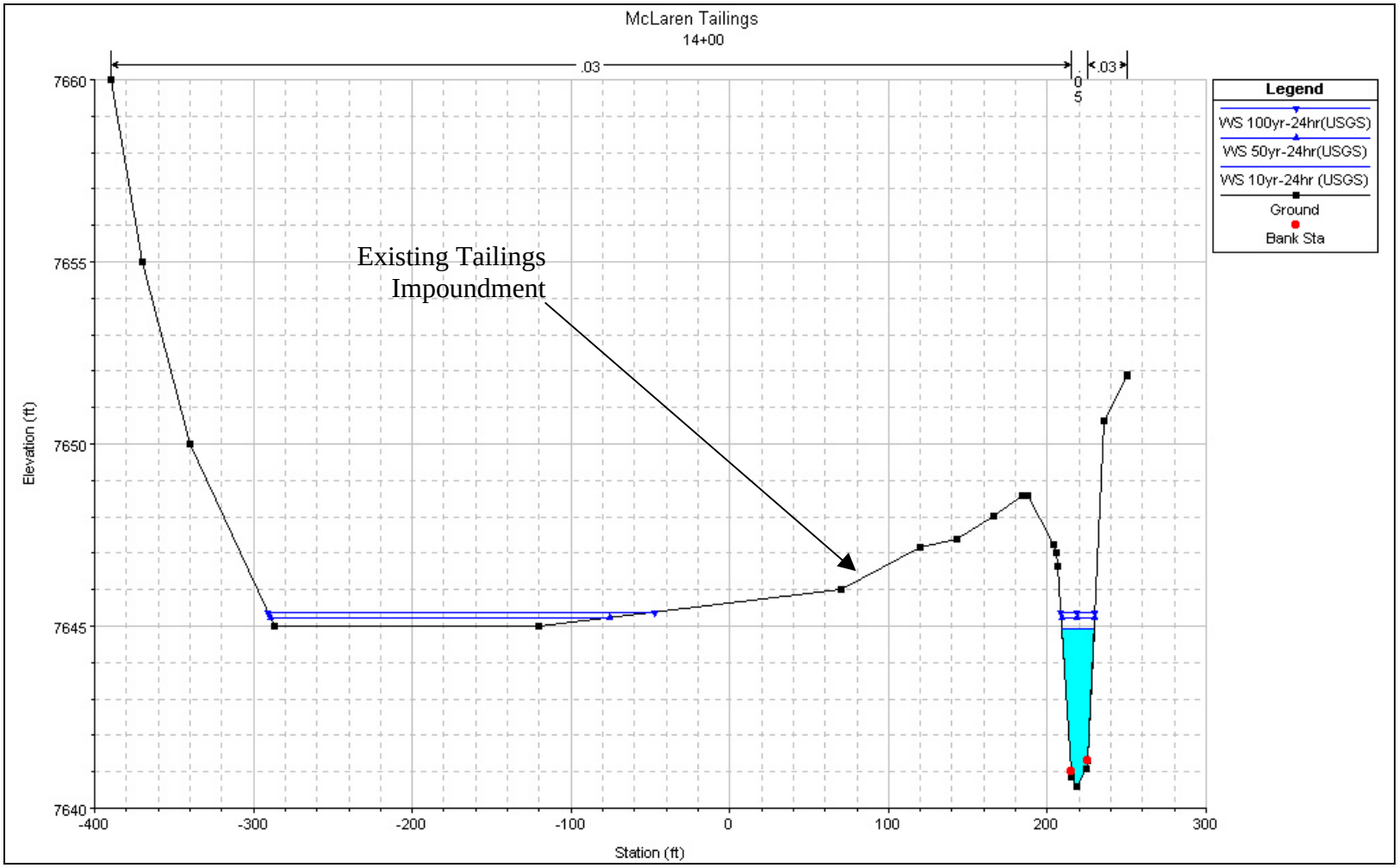

Figure 2: Cresting of the 50- and 100-year Flood Events onto the Existing McLaren Tailings Impoundment at Cross-Section 13 (Station 14+00 on Figure 7-8).

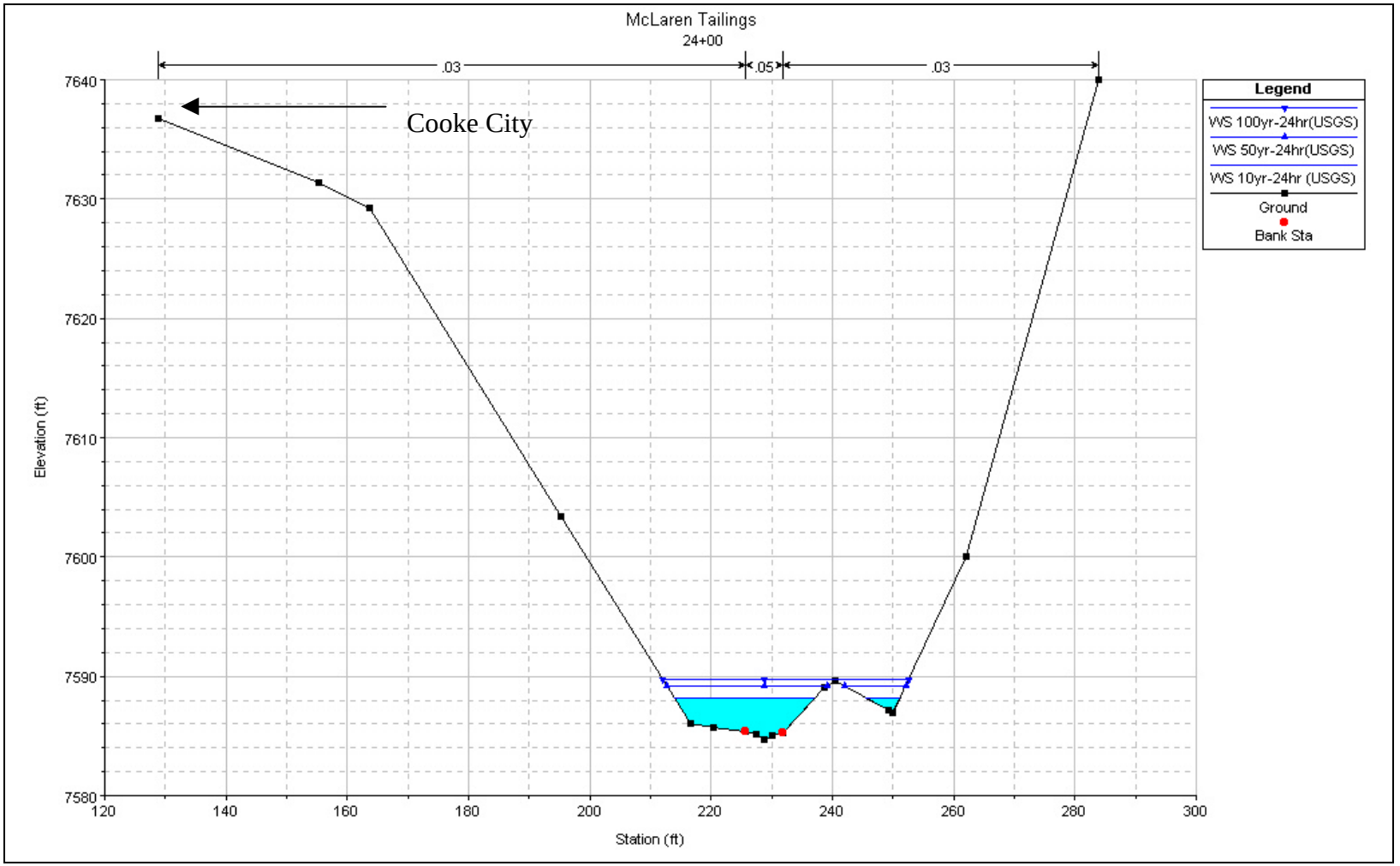

Figure 3: Soda Butte Creek Cross-Section Adjacent to Cooke City (Left Side) and the Proposed Repository (Right Side), (Station 24+00 on Figure 7-8).